

Understanding the Different Ecological Roles of Three Tilapia Species in Lake Turkana, Kenya

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Lake Turkana, located in Kenya, is the world's largest desert lake and is primarily fed by the Omo River in Ethiopia. The tribes that surround the lake are traditionally pastoralists, however, their attitudes toward fishing are changing. The Kenyan government is interested in increasing the fisheries production of the lake, as its production is low for a lake of its size. At this time, the majority of catch that comes from the lake is made up of tilapia. This fishing occurs primarily in the shallow inshore areas on the western side of the lake. There are three species of tilapia that reside in the Lake Turkana: *Oreochromis niloticus*, *Tilapia zilli*, and *Sarotherodon galilaeus*. These fishes are typically difficult to distinguish because of their morphological similarities, and because of this they are treated as the same species by the fishery. However, each species belongs to different genera and may have unique ecological requirements. Our goal for this study was to determine the degree of overlap between the tilapia species in the lake. This was done using literature review and stable isotopes. Fish tissue samples were collected from four different sites in the central sector of Lake Turkana from 2008-2013. The samples were homogenized and packaged in the lab at Stony Brook University and then analyzed for ^{13}C and ^{15}N at Boston University. The data were analyzed using Stable Isotope Bayesian Ellipses in R, the output of which is an isotopic niche space, a proxy for ecological niches. *O. niloticus* had the largest niche of the three tilapia species. The isotopic niches of *O. niloticus* and *S. galilaeus* overlapped heavily, but not with the isotopic niche of *T. zilli*. The literature review supported these findings, showing that these three species have different reproductive requirements as well as diets in other African lakes. *O. niloticus* and *S. galilaeus* primarily feed on phytoplankton and epibenthic algae, while *T. zilli* feeds on macrophytes. Because of the differences that these findings demonstrate, it is suggested that the fishery should manage the three different tilapia species in Lake Turkana, Kenya, especially *T. zilli* separately.